Accuracy Evaluation of Ground-Based GPS Estimates of Precipitable Water Vapor

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A system for estimating precipitable water vapor (PWV) from GPS observations and collocated surface weather measurements has been developed at JPL, using the GIPSY software package. A similar system, using the GAMIT software package, exists at the University of Hawaii. Validation of GPS-based estimates of PWV is essential before these data are incorporated into numerical weather models. To this end we have compared estimates of PWV from the JPL/GIPSY and UH/GAMIT systems over the period of the DOE/ARM campaign at 7 NOAA wind profiler sites in April-May, 1995, and we have compared estimates from both systems to independent results from collocated radiosonde and water vapor radiometer (WVR) instruments at selected sites. Comparing the two sets of GPS-based PWV estimates provides insight into the effects of various elements of the estimation strategies employed in the two software packages on the quality of the estimates. We present the results of our comparisons and discuss possible improvements to the GPS PWV estimation strategy.

1.1995 Fall Meeting

2.06393440

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4. G (joint with A)

5. (a) G04 Ground-based GPS Measurement and Analysis of Atmospheric Water Vapor
(b) 0365 Troposphere
0394 Instruments and techniques
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6. Oral

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